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Understanding the underlying factors of Internet addiction across cultures: A comparison study

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ABSTRACT

Studies have shown that technology addiction distorts the true intentions of technology users. This is primarily due to the maladaptive perceptions that form as a result of the addiction to technology. Internet is the vehicle for e-commerce; therefore, understanding Internet addiction (IA) is critical to developing a sustainable and healthy environment for e-commerce growth and ignoring it could lead to a myriad of business, societal, ethical and legal ramifications. Internet Addiction Test (IAT) is a well-established instrument for measuring an individual's addiction level. While IAT has been widely adopted clinically and in research in many countries, the differences in the underlying constructs of IA among various countries have not been sufficiently examined. Using the data collected from 488 US, 453 African, and 209 Chinese college students, this study focuses on discovering the differences in the underlying properties of IA from a cross-cultural perspective. The analysis shows that a sizable percent of the users in each region suffers from IA problems. More importantly, the results indicate that the key underlying IA psychometric constructs are substantially different in different cultural, economic and technological contexts. Further, the implications of the findings and directions for future research are discussed.

1. Introduction

According to Internet Live Stats (2015), about 40% of the world population is on the Internet today compared to only less than 1% in 1995. Most developed countries have an Internet penetration rate of over 80% (e.g. US: 86.75%; Japan: 86.03%; Germany: 86.78%; UK: 89.90%; Denmark: 96.08%), and the highest year-over-year growth rates of Internet users are seen among developing countries, especially in the Africa continent (e.g. Uganda: 17%; Tanzania: 16%; Mali: 16%). While easy access to reliable Internet technologies has enhanced communication, commerce, education, and personal and organizational performance globally, compulsive and excessive Internet use is also on the rise due to our increasing dependence on the Internet for various aspects of our lives and work. Prior studies suggest that technology addiction, which is defined as "an obsessive pattern of IT-seeking and IT-use behaviors that takes place at the expense of other important activities," leads to negative psychological, behavioral and cognitive consequences (Turel et al. 2011, p. 1044). One type of technology addiction, Internet addiction (IA), which refers to an excessive and uncontrolled need to use the Internet, is found to be prevalent, especially among young people globally (Young 1998, Griffiths 2000, Frangos and Kiohos 2010). Over the past decade, advances in digital devices (e.g. mobile and wearable technologies) that connect people to the Internet easily and ubiquitously and the wide adoption of online social networking and gaming applications have been the key drivers in promoting the phenomenon of IA (Turel and Serenko 2010). Studies have shown that, if not diagnosed and managed effectively, IA has the potential to negatively affect one's task effectiveness, health, happiness, and relationships (Griffiths 2000, Widyanto et al. 2011). Thus, as the Internet is tightly weaved into the social and business fabric today, it is important to understand how much of the Internet use is fueled by IA rather than desirable system use.

While technology addiction research is still in its embryonic stage, empirical evidence reveals that technology addiction augments a user's intrinsic and extrinsic gain perceptions about a system; which in turn, leads to system overuse at an unhealthy elevated level (Turel et al. 2011). Addiction symptoms prevalent among technology addicts are salience, withdrawal, conflict, relapse and reinstatement, intolerance and mood modification, all of which can cause negative personal, societal and workplace related ramifications (Charlton and Danforth 2007, Griffiths 1998, Skoric et al. 2009, Turel et al. 2011). While most prior "information systems (IS) use" literature tends to consider technology-use as a

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positive phenomenon, recent studies are advocating incorporating user addiction in IS use research and asking the question of how IS use can be adjusted to healthy levels for technology addicts. As the Internet is the vehicle for e-commerce, IA poses a threat to the healthy and sustainable development of e-commerce. In the short term, e-commerce businesses may gain at the expense of addiction. For examples, one study found that online buying impulsiveness was affected by IA, which in turn was influenced by mental instability (Tao and Wu 2011). Another study links IA to positive perception about online marketing and buying intention (Hsiao et al. 2013). However, businesses' ability to prey on psychological dysfunctions, such as IA, is both unsustainable and troubling. Therefore, from a long-term perspective, e-commerce businesses would benefit more from a customer base of mentally healthy, productive and reasoned action-driven Internet users and, at the same time, fulfill their ethical and legal responsibilities to the general public by understanding and helping reduce IA.

The Internet Addiction Test (IAT) was developed by Young (1998) to assess an individual's addiction level. The instrument was first validated by Widyanto and McMurran (2004) and later widely adopted by researchers to evaluate the phenomenon of IA in various countries (e.g. Panayides and Walker 2012, Pontes et al. 2014). IAT instrument has received overwhelming support for its validity and reliability in measuring IA levels globally. In all the global adaptation of IAT, the 20 items included in IAT were employed as exogenous variables used to measure participants' IA level. To explore the psychometric properties of the IAT, Widyanto et al. (2011) identified three underlying factors that collectively defined Internet addiction: psychological/emotional conflict, time management, and mood modification. While the identification of these psychometric constructs of IA significantly enhanced the research community's understanding of the IA phenomenon, cross-cultural stability and robustness of these constructs have not been sufficiently investigated. This raises the question of whether these IA constructs are generalizable across cultures. Obviously, cross-cultural studies are important as IA has become a global phenomenon. Many countries have reported alarming statistics regarding IA. For example, a study estimated that over 10 million Chinese teenagers met IA diagnostic criteria, and South Korea government now considers IA one of the most serious public health issues (Block 2008, Steiner-Adair 2015). The global emergence of IA has intensified as mobile access to the Internet is widely available and this has sparked the need for a better understanding of IA and its mitigation in an international context (Chen 2015, Dutta 2015, The Telegraph 2015). Most existing IA studies are US or western-centric; hence there is an urgent need to get a clear understanding of the characteristics of IA in different cultures. Cultural differences may affect how IA is diagnosed and treated in different countries and how a multinational organization manages IA among its employees. Furthermore, clinical studies have reported conflicting results regarding the outcomes of IA treatments administered in different countries that might be due to cultural differences (Winkler et al. 2013). Therefore, identifying the key cultural differences in IA could lead to useful recommendations about the appropriate diagnosis and treatment approaches in different cultures.

In the information systems research, there is a need to extend IS theories that are currently mostly US or western-centric, to the global context. This is necessary as technology, the Internet, and their use are spreading rapidly across the globe. Simply applying IS theories formulated with a US or western-centric view to other national and cultural settings often leads to misguided, erroneous, and conflicting results. Understanding the psychometric structure of technology-related instruments in diverse cultures is important as it sheds light on the impact of culture on how individuals and firms adopt and use information technology. There do exist some previous studies that have performed cross-cultural validation of key IS theories such as Technology Acceptance Model (e.g. Straub et al. 1997) and instruments for measuring information technology capability (e.g. Zhang et al. 2011), business IT alignment (e.g. Chen 2010), trust (e.g. Jarvenpaa et al. 2006, Chien et al. 2014), information privacy concerns (e.g. Malhotra et al. 2004), computer self-efficacy (e.g. Barbeite and Weiss 2004) and innovativeness (e.g. Steenkamp et al. 1999). All of these studies have emphasized the importance of cross-cultural context in the understanding of key IS issues. Therefore, in line with these studies, the proposed research in this paper is significant as it makes an important contribution to the IS research by performing a cross-cultural comparison of the psychometric constructs of IA.

The primary objective of this study is to examine the psychometric properties of IAT in a three country comparison study. We posit that while IAT has been widely adopted globally to evaluate the IA level of individuals, the underlying psychometric factors may differ across cultures, which would lead to drastically different symptoms, diagnosis methods and treatments of IA in different cultures. Specifically, this study will examine whether the same underlying factors of IAT identified by Widyanto et al. (2011) exist among US, African and Chinese Internet users. Also, another objective of this study is to evaluate and compare the levels of IA among the three groups of users. A deeper understanding of the psychometric constructs of IA across cultures gained by this study will allow us to integrate IA in e-commerce user behavioral research more effectively and prudently.

2. Literature review

2.1. Internet addiction

Researchers have identified social isolation, neglect of personal responsibilities, relationship difficulties, and overwhelming internet pre-occupation as consequences of excessive and problematic Internet use (Young 1998, Griffiths 2000, Widyanto and McMurran 2004, Morahan-Martin 2008). Additional studies acknowledge the pervasive nature of IA and its impact on users' cognitive and behavioral symptoms including diminished impulse control, loneliness, depression, distraction, irritability and using the Internet as a tool for social comfort (Davis et al. 2002, Caplan and High 2006). As a social comfort tool, the Internet tends to provide distraction that allows addicts to procrastinate or avoid stressful events, tasks, or thoughts. Internet addicts tend to display behavior symptoms commonly found in all technology addictions including salience, withdrawal, conflict, relapses and reinstatement, tolerance and mood modification (Turel et al. 2011). Razieh et al. (2012) report that among university students, preexisting conditions, such as anxiety, were an effective predictor of IA predisposition. Lack of confidence in face-to-face interaction and perceived sense of control during cyber interactions have also been found to be contributing factors of IA (Caplan 2006). On the other hand, extroverts and users with high emotional stability are found to be at low risk for IA (Celik et al. 2012).

Despite its profound impact on users' mental stability and behaviors, IA often goes undiagnosed clinically and is frequently denied by addicts (Young 1998). Even the mental health profession is debating the existence and definition of IA. The inclusion of IA in the 5th edition of *Diagnostic and Statistical Mental Disorder* was considered but later overruled due to a lack of research evidence and the argument that IA was a result of other preexisting mental conditions (Weinstein and Lejoyeux 2010). Young (1998) suggested that pathological gambling was the most akin disorder to IA and subsequently developed the 20-item Internet Addiction Test based on the criteria used for pathological gambling. IAT advocates